

Industrial - Control

Third summary

Micro-Controllers Lec 2,3

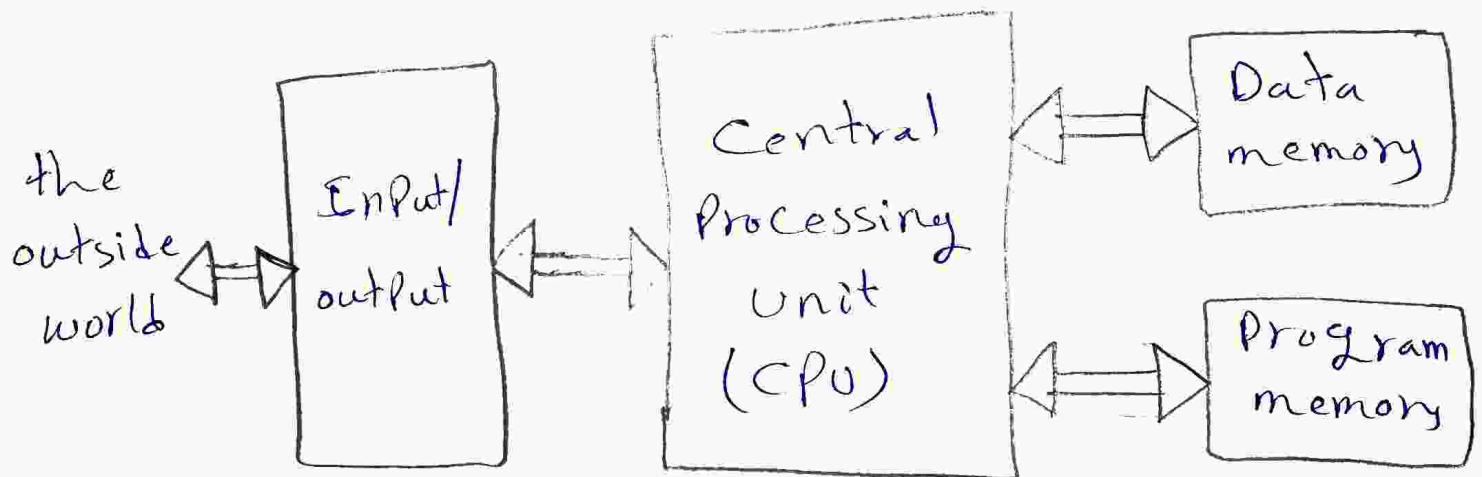
# Micro controllers & Embedded systems

## Embedded systems

↳ system whose principal function is not computational, but which is controlled by a computer embedded within it.

slides 1 3 never stop في الدنيا

## Computer essentials



## Instruction sets

CISC : Complex instruction set Computer

RISC : Reduced " " "

## Memory type

لعل الذكرى تنفع المؤمنين

volatile : random access memory (RAM)

Non- " : Read only memory (ROM)

## Microprocessors & Micro Controllers

- ↳ micro processor is processor on a silicon chip.
- ↳ micro controllers are used in embedded computing.
- ↳ micro controller is microprocessor with added circuitry.

في الرسمة بتاعه ال (microcontrollers) في ال (slides)

## PIC microcontrollers

- ↳ Peripheral interface controller, was designed by General Instruments.
- ↳ PIC was sold to Microchip.
- ↳ Feature:-
  - \* low-cost.
  - \* Harvard-structure.
  - \* RISC.
  - \* 8-bit.
  - \* self-contained.
  - \* pipelined.
  - \* single accumulator.

→ microchip 12F508 is good micro-controller to introduce range of features of microcontrollers in general and of PIC in particular.

\*What is meant by active-high? active-low?

Active high → switch is said to be active-high when activating it (pressing) will cause the input of P3 to be high.

\*What command is used to read the state of an input?

Do

DEBUG ? IN3

PAUSE 250

Loop

\*What command structure is used to make decisions? (IF-then-else) والشرطية

Do

DEBUG ? IN3

IF (IN3 = 1) THEN

HIGH 14

PAUSE 50

LOW 14

PAUSE 50

ELSE

PAUSE 100

ENDIF

Loop

IF (Condition) THEN Code

IF (Condition) THEN  
Code

ENDIF

IF (Condition) THEN  
Code

ELSEIF (Condition) THEN  
Code  
ENDIF

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\* AND, OR, XOR are logical operations.

What does each required to be true?

AND: both conditions have to be true (1 & 1)

OR: one of them or both of this ~~have~~ have to be true (1 & 0 or 1 & 1)

XOR: two conditions are different such that (0 & 1 or 1 & 0)

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\* What does the random command do? What is meant by seed value?

Random Command

↳ used to provide a pseudo-random number generator based on a seed value

Seed Value

↳ It provides starting point.

↳ by changing it, sequence changes.

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\* PIN and CON can greatly

increase code readability.



\* Why does real-world use require extensive testing?

↳ To ensure it is accurate and operates correctly under all circumstances.

### Notes

\* PIN Command :

↳ used to name I/O

↳ using it, improve the readability of code.

\* CoN Command

↳ used to name static values (Constants)

